
Suisun Marsh Monitoring Program Channel Water Salinity Report

Reporting Period: November 2004

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per SWRCB Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity. Specific electrical conductivity is referred to in the reports as "specific conductance". The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below:

Station Identification	Station Name	General Location	Classification
C-2*	Collinsville	Western Delta	Compliance Station
S-64	National Steel	Eastern Suisun Marsh	Compliance Station
S-49	Beldon's Landing	North-Central Suisun Marsh	Compliance Station
S-42	Volanti	North-Western Suisun Marsh	Compliance Station
S-21	Sunrise	North-Western Suisun Marsh	Compliance Station

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh.

Station Identification	Station Name	General Location	Classification
S-97	Ibis	Western Suisun Marsh	Monitoring Station
S-35	Morrow Island	South-Western Suisun Marsh	Monitoring Station

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

2. Monitoring Results

2.1 Channel Water Salinity Compliance

During the month of November, 2004, salinity conditions at all five compliance stations are in compliance with channel water salinity standards of SWRCB (Table 1). Compliance with standards for the month of November was determined for each compliance station by comparing the progressive daily mean of high-tide specific conductance (SC) with respective standards. The standard for compliance stations C-2, S-64, S-49 were 15.5 mS/cm and for S-42 and S-21 were 16.5 mS/cm during November 2004. Table 1 lists monthly mean high-tide SC at these compliance stations. The progressive daily mean (PDM) is the monthly average of both daily high-tide SC values. The mathematical equation is shown below.

$$\text{PDM} = \frac{\sum \text{daily average of high tide SC}}{\text{\# days of the month}}$$

2.2 Delta Outflow

The November Delta outflow ranged between 2,600 cfs to 11,000 cfs. Outflow was increased above 8,000 cfs at the first site of precipitation on November 4, 2004 and remained above 8,000 cfs until November 8, 2004. Thereafter, outflow dropped to about 2,700 cfs due to no precipitation activity until mid-November. The second wave of precipitation activity resulted outflow to peak at 11,000 cfs and declined to about 4,000 cfs and remained steady until the last precipitation activity on November 28, 2004, when it increased briefly above 6,000 cfs for a few days. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for November is listed below:

Month	Mean NDOI (cubic feet per second)
November	5,802

2.3 Rainfall

Total monthly rainfall at the Waterman Gauging Station in Fairfield during November 2004 is listed below: The largest precipitation occurred on November 13, 2004.

Month	Total Rainfall (inches)
November	3.30

2.4 Suisun Marsh Salinity Control Gate (SMSCG) Operations

Operations and flashboard/boat lock installations at the SMSCG during November 2004 is summarized below. The last phase (i.e. November 1 to 9) of the fish passage study had the gates operating with flashboards installed and boat lock closed. Thereafter, the gates are operated to control salinity with boat lock open configuration per NOAA request for the remainder of the control season.

Date	Gate status	Flashboards status	Boat Lock status
November 1-9	3 gates operating	Installed	Closed
November 10-30	3 gates operating	Installed	Open

3. Discussion

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operation of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions during the Reporting Period

During November 2004, salinity levels at Collinsville(C-2), National Steel(S-64), and Beldons (S-49) was below 10.0 mS/cm, whereas at Sunrise Club(S-21) and Volanti(S-42), it varied between 9.0 mS/cm and 12.0 mS/cm as shown in Figure 1. At the two monitoring stations(S-97 and S-35) salinity levels ranged from 14.0 mS/cm and 16.0 mS/cm as shown in Figure 2. Despite increased precipitation activity from November 11 to 13, 2004, which result in increased outflow, salinity levels continues to raise at a low to moderate rate at most marsh stations, except at Collinsville and western stations as shown in Figures 1 and 2. This is probably a result of the boat lock being in an open status after October 9, 2004 (i.e. end of the fish passage study). The opening of the boat lock allowed salinity intrusion to occur over the tidal cycle, however, it was at a controllable level. Although the increase in salinity levels at most marsh stations was low to moderate, it leveled off and remained stable for the remainder of the month and all stations both eastern and western stations salinity levels were well below the monthly standards.

Western sites had very little salinity activity as shown in Figure 2. The steady drop in salinity at S97 during the second half of November was a result of creek runoffs from the precipitation events.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high-tide SC at the compliance and monitoring stations for November 2004 were compared with means for those months during the previous nine years (Figure 4).

Means salinity pattern of all compliance and monitoring stations are similar to that of 2000, but lower in magnitude, except at S97 and S35 where both sites are about the same to that of 2000 salinity levels at the end of the month. Also, S42 was higher than that of S21 in 2004, whereas S42 was either lower or about equal to that of S21 in the previous nine years. Compared to previous nine years, November 2004 salinity levels were ranked seventh in high Specific Conductance.

Table 1**Monthly Mean High Tide Specific Conductance at Suisun Marsh
Water Quality Compliance Stations****November 2004**

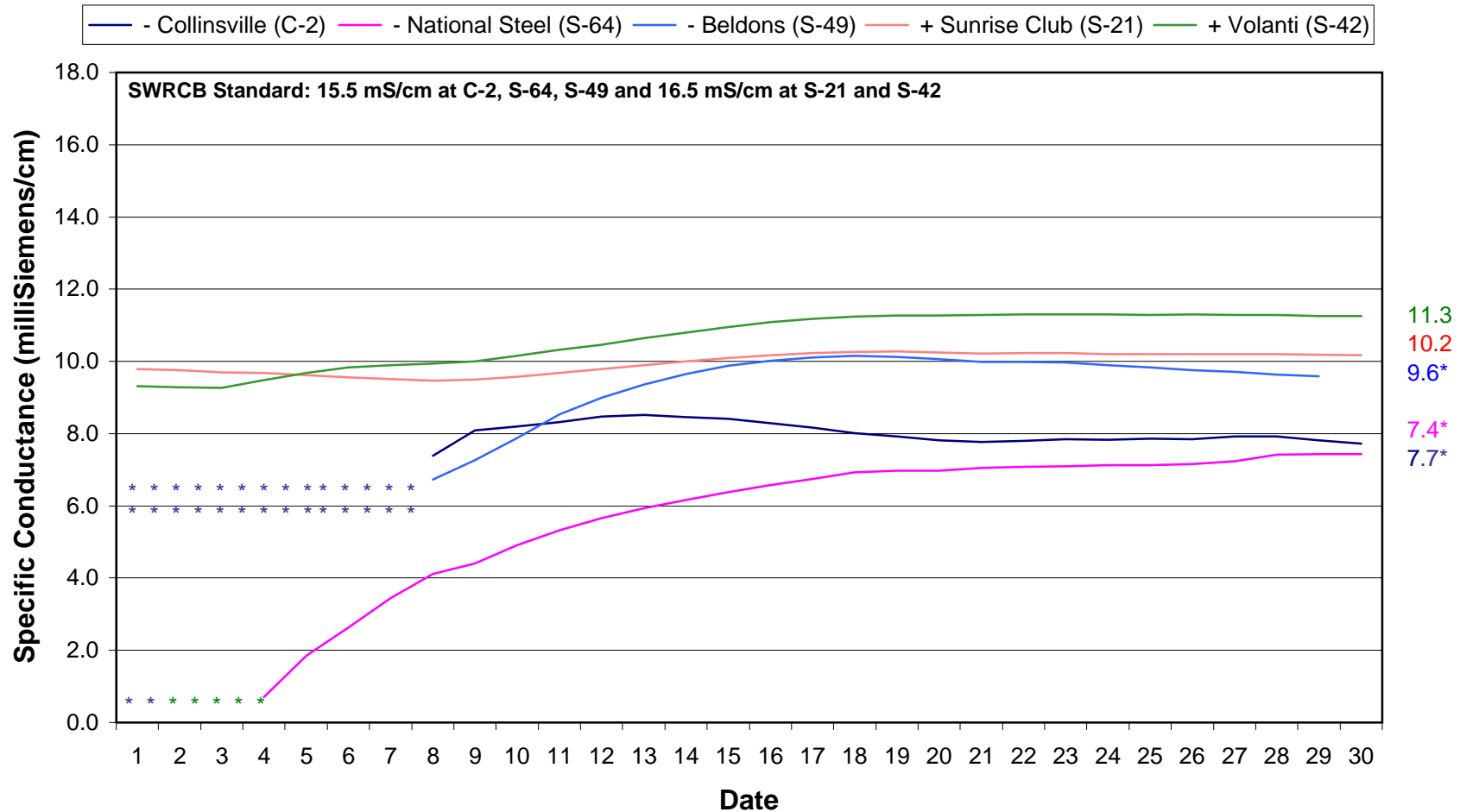
Station	Specific Conductance (mS/cm)*	Standard	Standard meet?
C-2**	7.7	15.5	Yes
S-64	7.4***	15.5	Yes
S-49	9.6***	15.5	Yes
S-42	11.3	16.5	Yes
S-21	10.2	16.5	Yes

*milliSiemens per centimeter

**The representative data from nearby USBR station is used in lieu of data from station C-2.

*** S64 and S49 had days of missing salinity data due to salinity equipment failure. However, the number of missing data is not enough to alter the outcome of end of month PDM value.

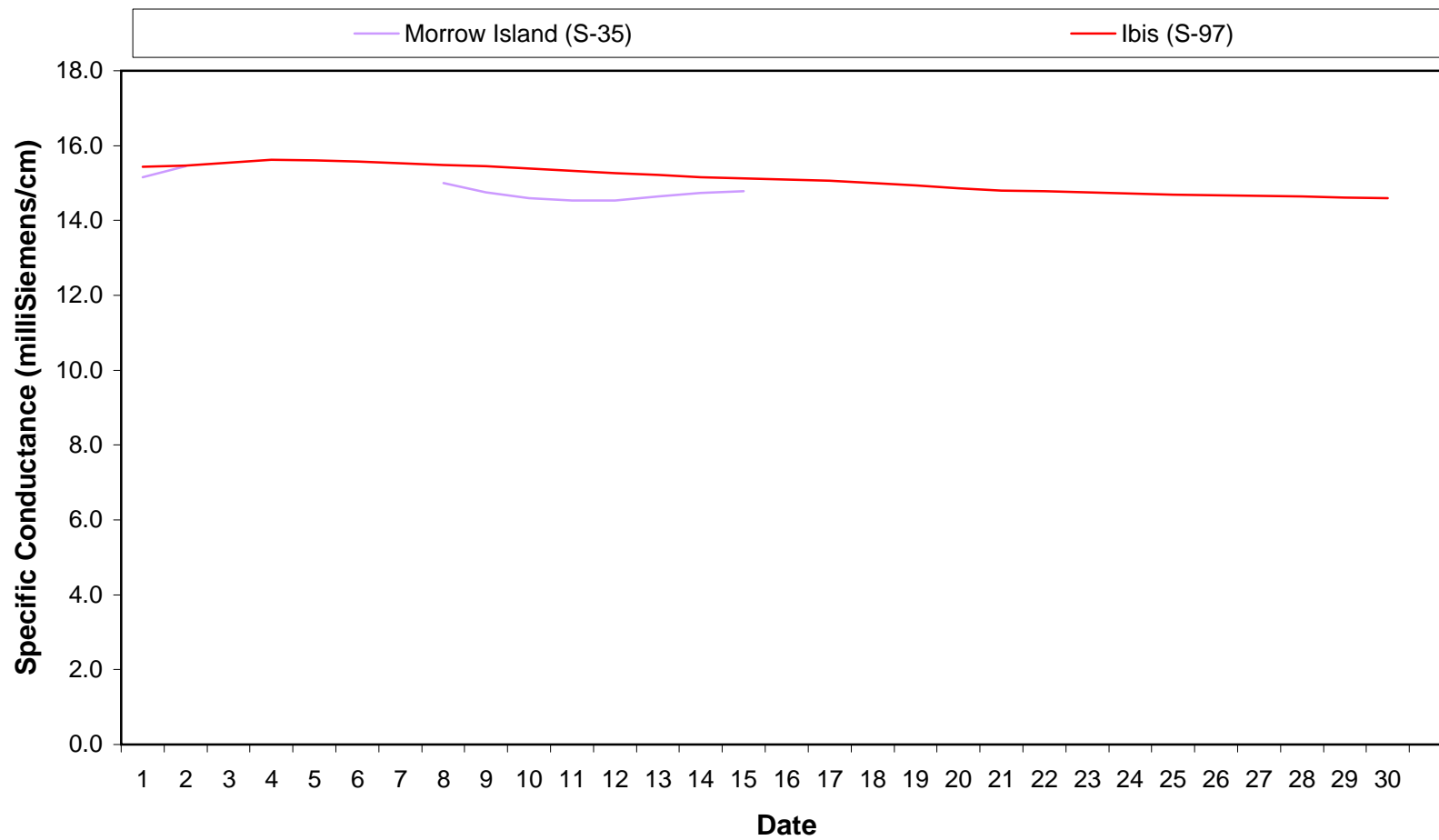
Figure 1 - Suisun Marsh Progressive Mean High-Tide Specific Conductance for November 2004



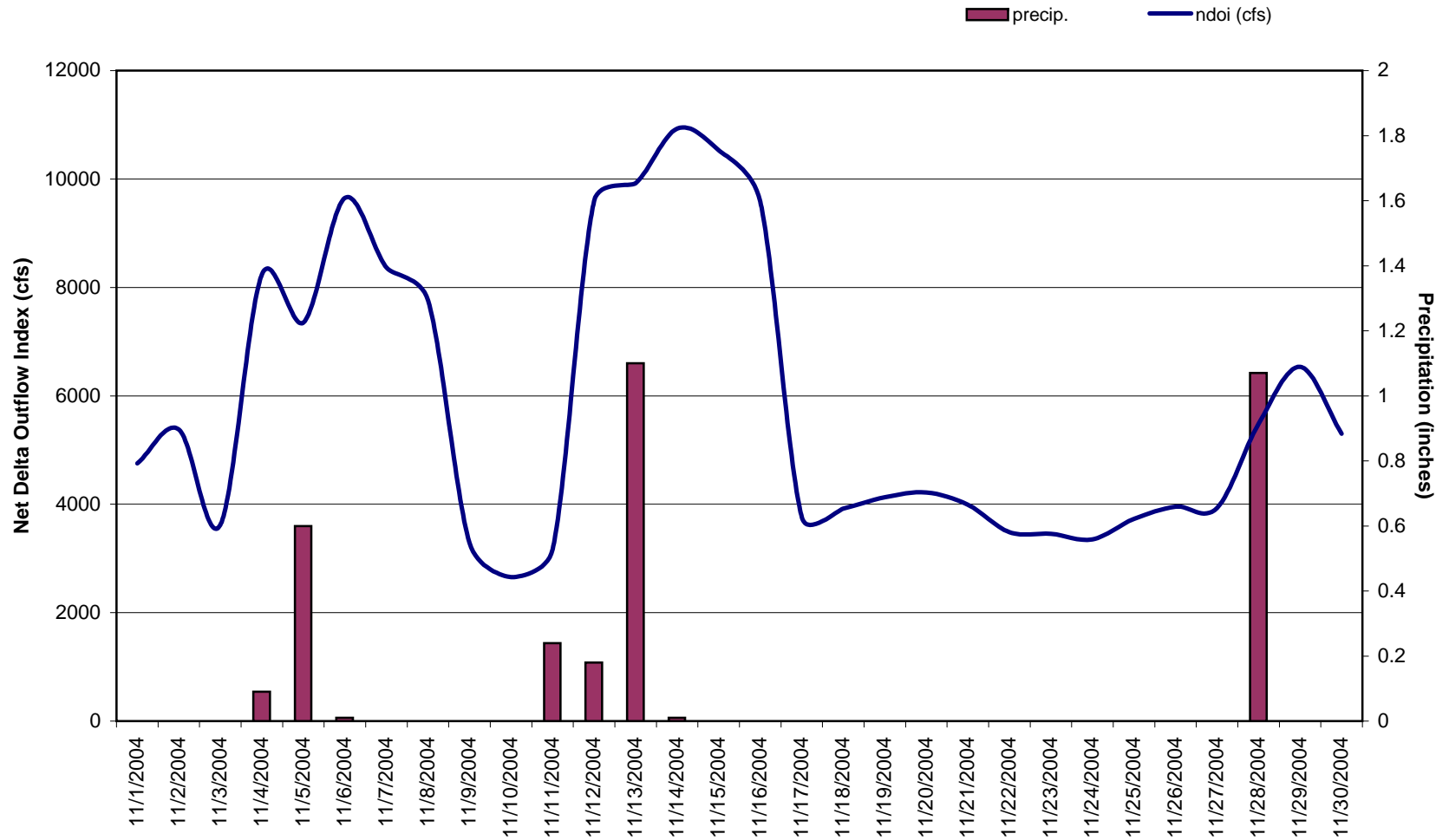
* End of month PDM value not actual due to missing data; however, the number of missing data is low enough not to alter end of

* * * * * Missing data due to equipment problems.

**Figure 2. Suisun Marsh Progressive Mean High-Tide Specific Conductance
at Monitoring Stations S35 and S97
November 2004**

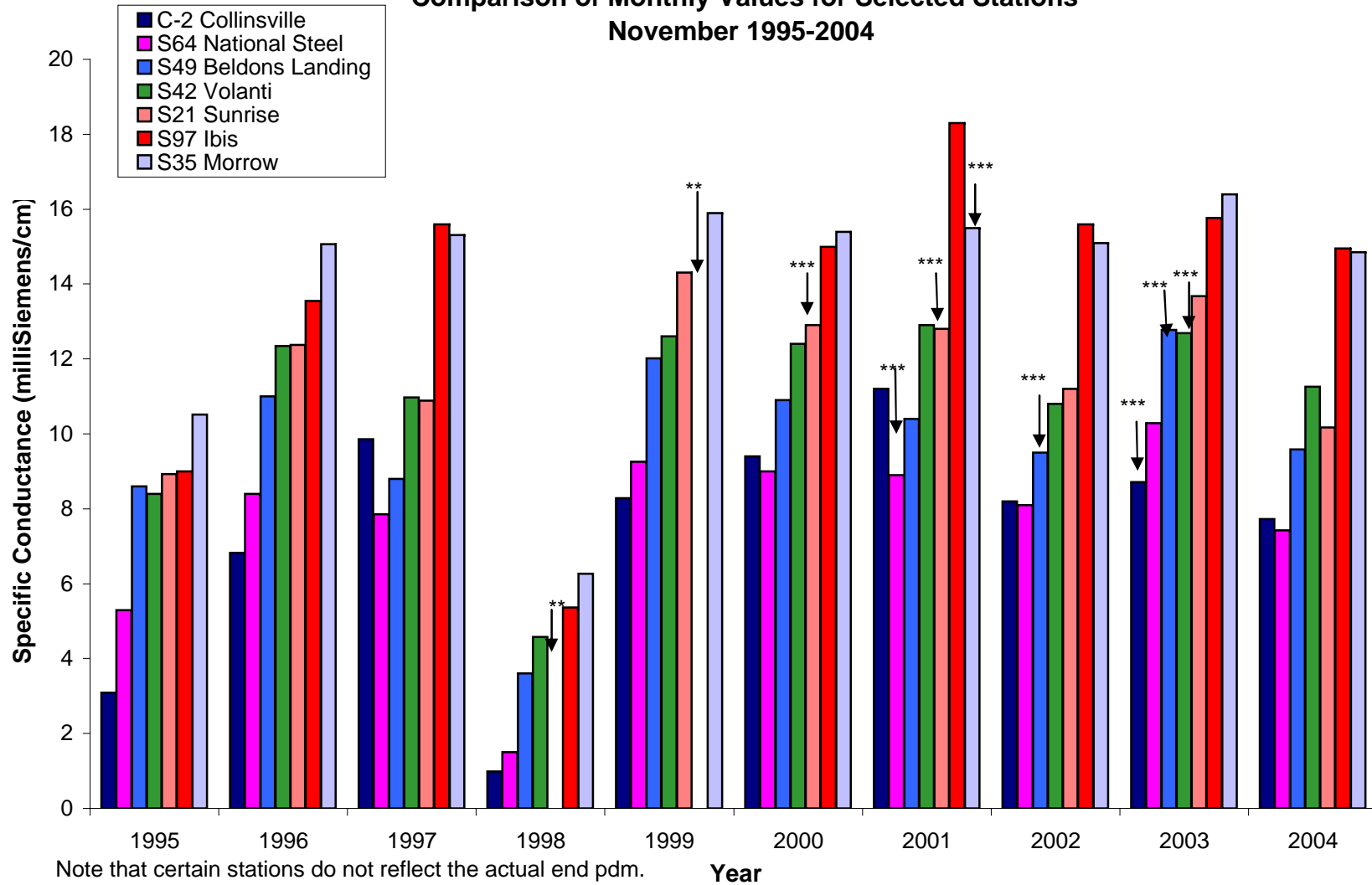


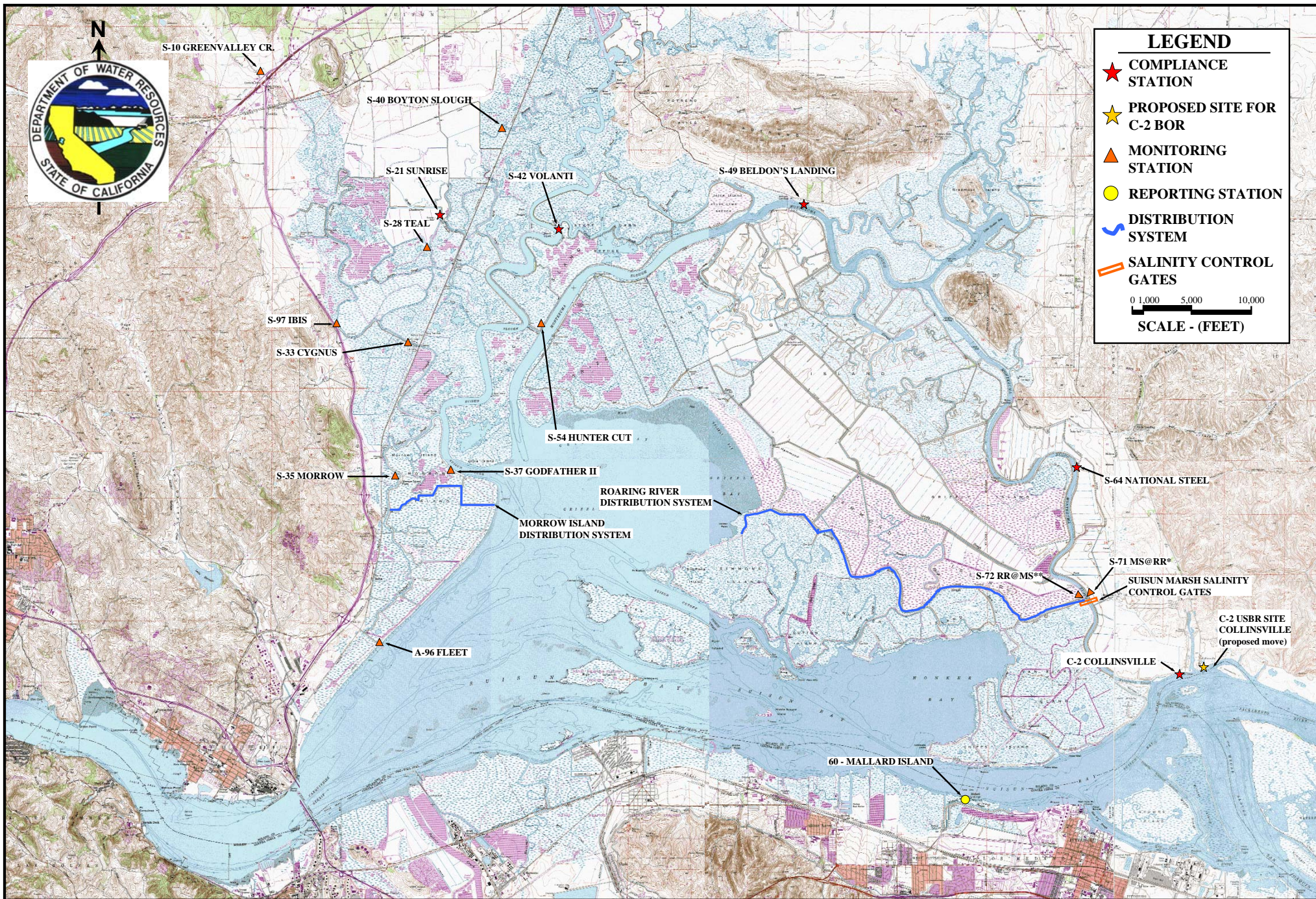
**Figure 3. Daily Net Delta Outflow Index and Precipitation*
November 2004**



*Preliminary DWR, O&M Delta Outflow data and precipitation from Fairfield Water Treatment Plant.

**Figure 4. Monthly Mean Specific Conductance at High Tide:
Comparison of Monthly Values for Selected Stations
November 1995-2004**





SUISUN MARSH PROGRAM WATER QUALITY MONITORING AND CONTROL FACILITIES